Claims

1. Method for demounting and remounting of hammers (1.3), hammer axles (1.5) and/or protective caps (1.4) of rotors (1) of hammer crushers with the help of a hammer axle pulling device (2), comprising the steps

a) exposing the rotor (1), which remains mounted in at least one part of the housing, and rotating and securing the same in an upper dead center position of die respective hammer axle (1.5);

b) affixing a pulling head (2.2) on an exposed end of the hammer axle (1.5) (Fig. 1b);

c) mounting a cross member (2.1) with fixing elements (**2.2**) of a hammer axle pulling device (2) in a position in which the fixing elements (2.3) match corresponding fixing elements (1.6) on a front face of the rotor (1) (Fig. 2, Fig. 3 A-A, B-B);

d) pulling a releasable element (2.5) of a slide (2.4) of the hammer axle pulling device (2) and keeping said releasable element (2.5) available;

e) producing a rigid and subsequently releasable connection between the fixing elements (2.3) of the cross member (2.1) and the fixing elements (1.6) of the rotor (1) (Fig. 3 B-B);

f) advancing the slide (2.4) of the hammer axle pulling device (2) to a position in which the pulling head (2.2) affixed on the hammer axle (1.5) is connected to the slide (2.4) with a positive fit by means of the releasable element (2.5) that is provided (Fig. 1b);

g) securing the position of the hammers (1.3) and optionally, of the protective caps (1.4);

h) retracting the slide (2.4) of the hammer axle pulling device (2) and simultaneously pulling the hammer axle (1.5) out to a first position in which at least one hammer (1.3) and/or optionally, a protective cap (1.4) can be removed freely (Fig. 1c, 1/3 stroke);

i) releasing the releasable connection between die pulling head (2.2) and the slide (2.4) using the releasable element (2.5);

j) once more, advancing the slide (2.4) to another position in which the pulling head (2.2) is again connected to the slide (2.4) with a positive fit;

k) once again, and optionally repeatedly, retracting the slide (2.4) and pulling the hammer axle (1.5) out to a position in which all hammers (1.3) and/or protective caps (1.4) and optionally the hammer axle (1.5) are removed, thereby finishing the demounting step (Fig. 1c, 2/3 stroke, 3/3 stroke);

thereafter remounting by

l) initially advancing the slide (2.4) connected to the new hammer axle (1.5), while subsequently reversing the order of the steps b) to k), as well as reversing the corresponding operational steps from the installation of the hammers (1.3) and/or protective caps (1.4) to the release of the fixing elements (2.3) of the cross member (2.1) of the slide (2.4) from the fixing elements (1.6) of the rotor (1) and removal of the cross member (2.1) by retracting the slide (2.4), as well as releasing the attachment of the pulling head (2.2) to the hammer axle (1.5) and placing the rotor (1) in the ready state for the comminution process.

2. The method of claim 1, **characterized by** repeating the steps a) to l) according to the remaining number of hammer axles (1.5) to be exchanged in the rotor (1) and/or the hammers (1.3) and/or protective caps (1.4) to be replaced.

3. The method of claim 1, **characterized by** releasing/remounting a locking element (1.7) that secures the hammer axle (1.5) on the rotor (1).

4. The method according to one of the claims 1 to 3, **characterized in** that in process step e) the releasable connection with locking lever (2.6) secured by nuts (2.7) is established by rotating the fixing elements (2.3) of the cross member (2.1), which are formed as hammer head screws, and by engaging the same behind the fixing elements (1.6) of the rotor (1), which are formed as openings or slots, whereby the cross member (2.1) is affixed to the rotor (1).

5. The method according to one of the claims 1 to 4, **characterized in** that during a phase where a hammer (1.3) and/or a protective cap (1.4) can be demounted, a partially worn-out element (1.3, 1.4) can be remounted in the opposite effective direction by rotating the element 180°.

6. Device for carrying out the method, comprising a drive unit (2.8) connected to a lockable slide (2.4), with the drive unit (2.8) including a cross member (2.1) with fixing elements (2.3) for attachment to a rotor (1) of a hammer crusher (not shown), wherein both the entire slide (2.4) as well as the cross member (2.1) and the drive unit (2.8) can move relative to the rotor (1) and relative to one another, a pulling head (2.2) which is, on one hand, affixed on the hammer axle (1.5) and, on the other hand, connected to the slide (2.4) so as to be capable of assuming several relative positions thereto.

7. The device of claim 6, **characterized in** that the drive unit (2.8) is made of two hydraulic cylinders (2.8.1, 2.8.2) which are affixed on the slide (2.4) and whose piston rods (2.8.3, 2.8.4) are connected by the cross member (2.1).

8. The device of claim 6, **characterized in** that the drive unit (2.8) comprises essentially an electric motor with a spindle, wherein the spindle is connected to the cross member (2.1) by a threaded element.

9. The device according to one of the claims 6 to 8, **characterized in** that the cross member (2.1) has hammer head screws forming fixing elements (2.3), which engage in corresponding slots or openings (1.6) of an end disk (1.2) or a similar element of the rotor (1), which through rotation by locking levers (2.6) engage behind the end disk (1.2) and are secured by nuts (2.7), wherein in this position the cross member (2.1) is in a rigid and releasable connection with the rotor (1).

10. The device according to one of the claims 6 to 9, **characterized in** that the

pulling head (2.2) is connected to the slide (2.4) by a releasable element (2.5), such as an insertable interlocking element.

11. The device according to one of the claims 6 to 10, **characterized in** that the releasable element (2.5) can lock the pulling head (2.2) on the slide (2.4) in several spacings/positions and that the slide (2.4) has several suitable insertion positions therefor.

12. The device of claim 7, **characterized in** that when the piston rods (2.8.3, 2.8.4) are retracted, the slide (2.4) is arranged at a spacing in the axial direction of the rotor (1) which corresponds to the length of the respective hammer axle (1.5) plus tolerances, divided by the required or desired number of strokes for pulling the hammer axle (1.5), whereby the respective position assumed by the slide (2.4) is locked by the releasable element (2.5).

13. The device according to one of the claims 6 to 12, **characterized in** that the hammer axle (1.5), after having been completely pulled out, rests in the slide (2.4) and can optionally be exchanged against a new hammer axle (1.5), wherein its placement corresponds to the demounting and/or mounting position in the rotor (1) and the features recited in claims 6 to 12 are also applicable to the installation of the hammer axles (1.5).

Add A2

Add A3